Standardization of the Eyberg Child Behavior Inventory with Chronically Ill Children

Andrew Colvin Sheila M. Eyberg

University of Florida

Christina D. Adams

West Virginia University

This study presented normative data for chronically ill children using a demographically diverse sample of 345 children and adolescents representing a broad spectrum of disease types. Results from reliability and validity analyses supported the psychometric properties of the ECBI scores within this population. Age, gender, and race effects for ECBI scores differed from those obtained in healthy peers. This finding, in combination with methodological concerns, suggests that a separate normative base for chronically ill children is useful. Because of the brevity of administration and scoring, the ECBI provides a cost-effective method for pediatricians and other child health care professionals to screen for behavioral difficulties in their chronically ill patients. This identification can lead to appropriate prevention and intervention efforts.

Chronic medical illnesses affect 10 to 30% of North American children (Cadman, Boyle, Szatmari, & Offord, 1987; Gortmaker & Sappenfield, 1984) and serve as a significant source of life stress for the child and family (Wallander & Thompson, 1995). Correspondingly, children with chronic illnesses are frequently reported to have a higher incidence of psychological maladjustment than physically healthy children (Bennett, 1994; Lavigne & Faler-Routman, 1992; Pless, 1984), although the findings have been contradictory (Wallander & Thompson, 19). Links between specific chronic medical illnesses and psychological conditions have also been proposed (Wallander & Thompson, 19) and might account for the inconsistent findings. Yet, studies comparing specific chronic illness groups have been contradictory as well (e.g., Thompson, Hodges, & Hamlett, 1990; Wallander, Varni, Babani, Banis, & Wilcox, 1988). A recent meta-analysis suggested that it may not be the illness condition per se, but rather the degree of seriousness and functional impairment of the child's illness that is associated with psychological maladjustment (Lavigne & Faler-Routman, 19).

Discrepant findings also may be due to measurement error. As Johnson and Rodrigue (1998) noted, many studies designed to assess the psychological adjustment of chronically ill children have used rating scale measures of psychopathology developed and standardized for physically healthy children. These measures may, in some cases, produce inflated maladjustment scores for chronically ill children. Estimates of maladjustment in chronically ill children would then differ depending on the measure being used. Consequently, it appears that although children whose health is compromised by chronic illness may encounter increased risk of psychopathology, links between their physical and mental status remain inconclusive.

Whether children in a particular chronic illness group are likely to be more psychologically maladjusted than those in another or than healthy youngsters, the fact remains that a substantial minority of these young people will develop psychosocial disorders (Wallander & Thompson, 1995). Psychological maladjustment may introduce further stress to the family and exacerbate the course of illness. The health care professionals who care for children with chronic illnessplay a critical role in the identification of emotional and behavioral problems. They are often the only professionals able to place psychological problems into adequate perspective when parents and other adults close to the child are focused on issues of life and death.

It is in these kinds of situations that screening measures of psychological functioning may be most beneficial to pediatricians and their patients. With regular medical contacts, pediatricians can routinely conduct behavioral screening assessments to guide for the identificationof children who may need mental health preventive or intervention services (Wallander et al., 1988). A standardized instrument provides an objective index of the child's psychological functioning that cannot be obtained from parent complaint or informal observation in the examining room. To fit with typical clinic demands,

however, the instrument must be quick and easy to administer, score, and interpret. More importantly, it must be developed for use with chronically ill children.

Among the measures used to screen for children's emotional and behavioral health, few scales have been developed specifically for use with pediatric populations. For example, the Child Behavior Checklist (Achenbach, 1991) has been the most widely used instrument for evaluating psychological functioning of children with chronic physical conditions. However, Perrin, Stein, and Drotar (1991) have cautioned this use of the instrument because potential problems occur when scoring and interpreting results for this population. Moreover, the CBCL takes 20-25 minutes to complete and 15-20 minutes to hand score or 5-10 minutes to computer score. Because it is time-consuming to complete, score, and interpret, the CBCL does not seem well suited for a busy clinic practice (Jellinek, Murphy, & Burns, 1986).

In contrast, two instruments have been developed specifically for use with pediatric populations: the Pediatric Symptom Checklist (PSC; Jellinek et al., 1988) and the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999). The PSC is a 35-item parent-report screening questionnaire designed for use with 6- to 12-year-old children in outpatient pediatric practice. Using a 3-point response scale (never, sometimes, often), the PSC contains items that sample across a broad range of problems including anxiety, depression, conduct, and hyperactivity. Through the use of an overall cutoff score, the PSC identifies school age children experiencing psychological difficulties (Jellinek et al., 19). The PSC was found to identify pediatric outpatients at risk for behavior difficulties who otherwise would have been missed by the physician who, without the checklist results, classified them as having "adequate" functioning (Jellinek et al.). Several studies (e.g., Bishop, Murphy, Jellinek, & Dusseault, 1991; Lloyd, Jellinek, Little, Murphy, & Pagano, 1995; Murphy, Arnett, Bishop, Jellinek, & Reede, 1992) have found that pediatricians and family practitioners reported that the PSC was useful in identifying cases in need of referral. The PSC also is brief and easy to administer, score, and interpret, although its restricted age range (i.e., 6 to12 years) limits it use. Additionally, some researchers (e.g., Canning & Kelleher, 1994) have questioned the sensitivity of the PSC in identifying chronically ill children at risk for behavioral and emotional problems

Like the PSC, the ECBI (Eyberg & Pincus, 1999) was designed to measure common behavior problems in pediatric populations (Eyberg, 1985). Its initial normative data (Eyberg & Robinson, 1983; Robinson, Eyberg, & Ross, 1980) were collected on youngsters from a large metropolitan medical school pediatric clinic who presented with both acute and chronic illnesses. In that study, there were no significant differences between children with acute versus chronic illness, and therefore separate psychometric study of the ECBI with chronically ill children was not conducted (Eyberg & Robinson; Robinson et al.).

Nonetheless, the ECBI has a number of features that make it well suited for use with pediatric populations (Schuhmann, Durning, Eyberg, & Boggs, 1996). These features include its: (a) simplicity and brevity that allow it to be completed in 5 to 10 min prior to the appointment or mailed for completion in

advance; (b) single cutoff values for each scale across the age span, which can be quickly hand-scored (1 min) and interted; and (c) two scales which, when interpreted together, provide an index of parent tolerance (Brestan, 1998). The psychometric properties of the ECBI have been studied in samples of physically healthy children, and summarized by Eyberg (1992). Results have demonstrated high coefficients of reliability, including internal consistency and test-retest stability, and strong evidence of construct validity for its use with non-chronically ill children. A comparison group of chronically ill children, however, has not been examined to provide an estimate of variability and a basis for determining the clinical significance of youngsters' behavior problems in this population. It was the purpose of this study to evaluate the psychometric properties of the ECBI scales with chronically ill children and to establish preliminary normative data for this population.

Recently, the ECBI was restandardized with children and adolescents from pediatric clinics in the southeastern United States (Colvin, Eyberg, & Adams, 1999). Data collection from these sites resulted in a significantly larger proportion of chronically ill children than is represented in the general population; therefore, these children were separated from the standardization sample for independent study. The current study presents the data for these chronically ill children, to provide normative information specifically for this group of youngsters and to compare them to the non-chronically ill normative sample.

Although significant differences between the chronically ill and non-chronically ill children were not expected based on earlier studies (Eyberg & Robinson, 198; Robinson et al., 1980), we felt it was important to re-examine the question with the large sample available. We also sought to examine differences among specific illness groups, separated according to body system. Because the literature on differences among illness groups has been contradictory, this examination was exploratory. Finally, we sought to establish the psychometric properties of the ECBI for use with chronically ill children. In addition to examining the reliability of the ECBI scales among specific demographic groups, we evaluated the discriminative validity of the scales by comparing those children who had received treatment or referral for treatment for behavior and/or learning problems with the remaining sample. It was hypothesized that the former set of youngsters would obtain higher scores on both scales of the ECBI. We expected that all findings, taken together, would support the clinical utility of the ECBI with chronically ill children.

Method

Participants

Participants were recruited from six pediatric settings in Florida as part of a restandardization study for the ECBI (Colvin et al., 1999). Among 1,143 families who participated, 345 indicated on the demographic data sheet the presence of a chronic illness. These participants were separated from the larger sample for the current study. The 345 chronically ill children ranged in age from 2 to 16 years ($\underline{M}$ = 8.5; $\underline{SD}$ = 4.3), with 56% male and 44% female. The ethnic/racial distribution of the sample was 79% Caucasian, 17% African-American, 1% Hispanic, and 3% other. Children resided with both natural parents (61%), in a single-parent home headed by the mother (24%), with the mother and step-

father (9%), with foster parents or relatives (5%), with father and step-mother (< 1%), or in a single-parent home headed by the father (< 1%). The distribution of family socioeconomic status, according to the Hollingshead (1975) Four-Factor Index of Social Status, was as follows: 18% of the children in Group I (lowest), 23% were in Group II, 26% in Group III, 24% in Group IV, and 9% in Group V. Of the families reporting their county of residence (n = 336), 59% lived in an urban county and 41% lived in a rural county.

Using the information provided by the parent on the demographic questionnaire, each child was placed into one of the following chronic illness categories based on primary organ system involvement ratings by pediatrician: Pulmonary (22%), Neurological (18%), Renal (16%), Hematological/Neoplastic (15%), Cardiac (14%), Infectious/Immunological (8%), GI/Hepatic (5%), and Endocrine (2%). Twenty-two participants had more than one chronic illness diagnosis that crossed the organ system categories. In these cases, three pediatricians independently categorized these participants into one category based on their interpretation of a "primary" diagnosis. In all instances, at least two of the three physicians agreed on a category.

Procedure

A research assistant or receptionist gave the parents of children waiting for a doctor's appointment a cover letter describing the research, an informed consent form, a demographic questionnaire, an ECBI, and an envelope in which to place the completed forms. The parents were asked to complete these materials in the waiting room and to return them to the research assistant or receptionist, who also recorded the unaccepted packets to track participation rates. Across all data (including the restandardization data; Colvin et al., 1999), approximately 7% of parents who were approached declined to participate in the study, and approximately 6% of those parents who agreed to participate did not complete either the demographic questionnaire or the ECBI. Packets were completed by the child's mother (84%), father (11%), or other adult caregiver (5%). Because no identifying information was requested on the materials, participants remained anonymous.

The Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) is a well-standardized, 36-item parent-report measure of behavioral difficulties in children between the ages of 2 and 16 years. The parent rates each behavior or item on two scales: (a) The parent rates the frequency of each behavior or item on a 7-point Likert scale from (1) *never* to (7) *always*, and the Likert ratings are summed to create the Intensity Scale score with a potential range of 0 to 253; (b) The parent also indicates whether each behavior is a problem for them on a *yes-no* scale, and the total number of *yes* responses across all items yields the Problem Scale score with a potential range of 0 to 36. Well-validated cutoff scores (Intensity Scale, 127; Problem Scale, 11) have been established to determine the need of a psychological referral for the child's behavioral difficulties (Eyberg, 1992). However, based on the restandardization data from the non-chronically sample, revised cutoff scores (i.e., Intensity Scale, 132; Problem Scale, 15) have been recommended (Colvin et al., 1999).

Results

Item Analyses

Mean intensity ratings for each item are presented in Table 1. On average, behaviors were rated to occur "seldom" or "sometimes." As shown in Table 1, items were endorsed as being problematic (Problem Scale) by 5% (steals) to 33% (gets angry when doesn't get own way) of parents. The results of item analyses are comparable to those found in the restandardization sample (Colvin et al., 1999).

Corrected item-total correlations between item intensity ratings and the Intensity Scale score ranged from .14 (wets the bed) to .75 (acts defiant when told to do something). Item 36 (wets the bed) had the only intensity rating with an item-total correlation coefficient below .30. For the problem ratings, item-total correlations ranged from .17 (refuses to eat food presented) to .67 (acts defiant when told to do something). One additional item (dawdles or lingers at mealtime) had an item-total correlation below .30. The mean item-total correlation coefficients were .53 (SD = .13; Median = .56) and .47 (SD = .11; Median = .49) for the Intensity and Problem Scales, respectively.

Cronbach's alpha for the entire sample of chronically ill children was .94 on the Intensity Scale, and the Kuder-Richardson-20 coefficient was .92 on the Problem Scale. The internal consistency coefficients within demographic groups (child gender, age, race, and rural versus urban county of residence) are shown in Table 2. All reliability coefficients are highly satisfactory. Taken together, the internal consistency results replicate corresponding findings from the original normative sample (Eyberg & Robinson, 1983; Robinson et al., 1980) and from the restandardization samples (Colvin et al., 1999), and support the internal consistency of the ECBI within this chronically ill sample of children.

Scale Analyses

The Intensity Scale scores ranged from 37 to 242. The mean for the Intensity Scale was 100.7 with a standard deviation of 33.0 and a standard error of the mean of .34. The Intensity Scale scores were normally distributed (skewness = .62, kurtosis = .56). The Problem Scale scores ranged from 0 to 34. The mean for the Problem Scale was 7.2 with a standard deviation of 7.1 and a standard error of the mean of .39.

Within this diverse sample of chronically ill children, the Intensity Scale and Problem Scale scores were significantly, but moderately, correlated with one another ($r = .67$; $p < .0001$). These results are consistent with the original normative samples (Eyberg & Robinson, 1983; Robinson et al., 1980) and the restandardization sample (Colvin et al., 1999) in showing that the two scales measure related but distinct dimensions of conduct problem behavior in chronically ill as well as healthy children.

ECBI Scores as a Function of Demographic Variables

Pearson (for continuous variables) and point-biserial (for dichotomous variables) correlations were used to explore the relation between ECBI scores and demographic variables for families with chronically ill children. These correlations, presented in Table 3, show that age and SES were not related to ECBI scores. A small, but statistically significant relationship between Rural/Urban status and the Problem Scale scores suggested that rural living is weakly associated with higher Problem Scale

scores. Small, positive correlations were also obtained between the Intensity Scale scores and both gender and race. Note that although the correlation coefficients were statistically significant, they were quite low in magnitude (i.e., $\leq .15$).

To further examine demographic effects on ECBI Intensity Scale, differences between demographic groups were examined using ANOVA. The ECBI Intensity Scale score served as the dependent measure, and three factors (gender; age group; race) were the independent variables. Only Caucasian and African American children were included due to the small number of children in other ethnic groups. The sample was divided into three age groups, 2-6, 7-11, and 12-16 years, corresponding to preschool, school age, and adolescent youngsters. Results indicated a significant main effect for Race, F (1,330) = 5.8, $p < .05$, and a significant Age Group X Gender interaction, F (2,330) = 3.7, $p < .05$.

Inspection of mean Intensity Scale scores revealed that Caucasian children obtained higher scores (M = 102.7, SD = 33.8, n = 273) than did African American children (M = 89.7, SD = 28.3, n = 58). In the non-chronically ill sample of children (Colvin et al., 1999), significant race effects were not found. Tests of Simple Effects for the significant Age Group X Gender interaction revealed a significant age group difference for males (preschooler > adolescent, $p < .0001$) and a significant gender effect for ages 2-6 ($p < .005$; Males > Females) and 7-11 ($p < .01$; Males > Females) years. Mean ECBI Intensity Scale scores for the age and gender groups in this chronic illness sample are shown in Table 4. Although a significant Age Group X Gender interaction was obtained in the non-chronically ill sample (Colvin et al., 1999), post-hoc analyses revealed a dissimilar pattern of group differences. Specifically, school age and adolescent groups scored higher than preschoolers, and school age boys scored higher than girls did at these same ages in the non-chronically ill sample.

ECBI Scores as a Function of Respondent Gender

To compare scores between mother and father raters, t tests were performed. Because of highly disparate sample sizes (292 mothers, 36 fathers), 36 mothers were randomly selected from the sample to compare to fathers' ratings. Intensity Scale scores for mothers (M = 106.7, SD = 35.2) versus fathers (M = 96.0, SD = 24.0) were not significantly different, t (70) = 1.5, $p > .05$. On the Problem Scale, however, mothers' ratings (M = 9.4, SD = 8.3) were significantly higher than fathers' ratings (M = 4.6, SD = 4.9), t (70) = 3.0, $p < .01$, suggesting that the fathers who accompanied their chronically ill child to the pediatric appointment were more tolerant of their child's behavior problems than were the mothers who accompanied children to the appointment. These differences were not found in the Colvin et al. (1999) normative sample.

Discriminative Validity of the ECBI Scores

Using information reported by the parent on the demographic questionnaire, subgroups of children expected to have a higher than average number of behavior problems were identified for validity analyses and compared to the remaining subgroup of "non-problem" children. Specifically, children reported to have obtained treatment or received a referral for treatment for learning disabili-

ties and/or behavior problems ("problem" group) were compared to children not having any history of such referral or treatment. Independent samples t tests were conducted for both ECBI scores. Because the comparisons involved greatly unequal sample sizes ("problem" group, n = 98; "non-problem" group, n = 290), the separate variance estimates were used as the degrees of freedom.

Mean scores for the Intensity Scale were 115 (SD = 39) and 96 (SD = 29) for the "problem" and "non-problem" children, respectively, whereas mean scores for the Problem Scale were 10 ("problem" group; SD = 8) and 6 ("non-problem" group; SD = 6). Group differences were statistically significant for both the Intensity Scale, t (115.34) = 4.22, p < .0001, and the Problem Scale, t (116.56) = 4.05, p < .0001. These findings support the discriminative validity of the ECBI scores within a chronically ill population.

Comparison to Restandardization Sample

Independent samples *t* tests were used to compare the ECBI scores obtained in the chronically ill sample to those in the restandardization sample of non-chronically ill children (Colvin et al., 1999). On the Intensity Scale, there was no significant difference between chronically ill and non-chronically ill children on the Intensity Scale, t (1141) = -1.87, p > .05. The chronically ill sample obtained a mean intensity score of 100.7 (SD = 34.2) compared to a mean intensity score of 96.6 (SD = 35.2) in the non-chronically ill sample. Problem Scale scores also showed no significant differences between chronically ill and non-chronically ill children, t(1141) = -0.19, p > .05. In fact, the Problem Scale scores were almost identical across the two samples (Chronically Ill, M = 7.2, SD = 7.4; Restandardization, M = 7.1, SD = 7.7).

Using the cutoff scores suggested by the Colvin et al. (1999) restandardization data (Intensity Scale score = 132; Problem Scale score = 15), 56 (16%) of the chronically ill children had significant scores on either the Intensity Scale or Problem Scale. Of these children, 36 (10%) had significant cutoff scores on both scales, whereas 20 (6%) children had significant scores on the Intensity Scale only, and 20 (6%) children had significant scores on the Problem Scale only. Using the original cutoff scores (Eyberg, 1992), 19% (n = 65) of the sample would have been classified as clinically significant on the Intensity Scale, whereas 29% (n = 100) would have been clinically significant on the Problem Scale.

ECBI Scores as a Function of Type of Chronic Illness

To investigate differences in ECBI scores among illness categories, one-way ANOVAs were conducted for the Intensity and Problem Scale scores. Illness category (8 groups) was used as the independent variable in each analysis. Results for the Intensity Scale score were not significant, F (7,344) = 1.1, p > .05. In contrast, a significant group difference was obtained with the Problem Scale score, F (7,344) = 2.4, p < .05. Student-Newman-Keuls post-hoc tests indicated that the Pulmonary group (M = 8.9) had a significantly higher Problem Scale score than did the Cardiac group (M = 4.1). No other group differences were found. Mean ECBI scores by illness groups are shown in Table 5.

Discussion

This study presented the psychometric properties and normative data for chronically ill children on the ECBI based on a relatively large and demographically diverse sample of children and adolescents representing a broad spectrum of disease types. Results from reliability analyses supported the internal consistency of the ECBI scores within the chronically ill sample. Discriminative validity for the ECBI scores within the chronically ill sample was demonstrated by their ability to detect differences between those children who had received referral or treatment for learning and/or behavior problems and the children without any history of such difficulties. Using the revised cutoff scores, the ECBI scales also identified an at-risk group of 16% of the chronically ill children, comparable to the percentage of children identified by the PSC (14%) in an outpatient pediatric sample (Jellinek et al., 1988). Taken together, these findings suggest the usefulness of the ECBI with chronically ill, as well as healthy, children.

A primary question addressed by this study was the need for the ECBI to have a separate normative base for chronically ill children, given its original development in a pediatric sample and earlier evidence of comparable mean scores. Bycomparing the behavior problem scores of a chronically ill child to scores derived from other chronically ill children, the effects of normal illness behavior (e.g., pain complaints) which might be symptomatic of psychopathology (e.g., whines) in a physically healthy child, are controlled. Because we observed basic demographic effects on ECBI scores in the chronically ill sample that were different from findings with healthy samples, separate normative data for chronically ill children seem warranted. Further, unlike the results from the non-chronically ill normative sample, the mothers were found less tolerant of disruptive behaviors than the fathers of chronically ill children. Perhaps these findings result from the greater day-to-day childcare responsibilities that many mothers of chronically ill children experience. Indeed, mothers of conduct disordered children report higher ECBI Problem Scale scores than fathers (Eisenstadt, McElreath, Eyberg, & McNeil, 1994). Although for different reasons, both conduct-disordered children and chronically ill children require significant parental supervision and involvement. These issues, when considered together, provide strong rationale for having a separate normative base for youngsters with chronic health conditions.

Although the frequency of parent-reported problem behaviors for the chronically ill children, as a group, was no different than for the non-chronically ill children, the interaction between age and gender showed a particularly striking pattern of scores for boys across childhood. From the preschool to the adolescent age period, boys with chronic illness appear to show decreasing conduct problems with age. The degree of difference in the frequency of conduct problems between the youngest and oldest group of boys is substantial and, unlike patterns in the scores of non-chronically ill children, the differences appear to hold clinical meaning. It may be that the cumulative social impact of restricted physical activity typical of chronic illness has a differential maturing effect on the behavior of boys.

Several studies have shown that within the normal range, both ECBI scale scores correlate meaningfully with other

measures of psychological functioning in children and parents. The distribution and variability of ECBI scores in the chronically ill sample is similar to that in non-chronically ill samples and suggests that the ECBI score variations within the normal range are equally interpretable for children with chronic illness. Thus, the subtle changes in psychological functioning that may occur as a function of a child's disease process, or its treatment, may be reflected in the ECBI scores.

The examination of ECBI scores within individual illness categories revealed no significant group differences in behavior problem frequency. As an index of psychological maladjustment, the Intensity Scale findings are consistent with Thompson et al. (1990), and suggest that for studies addressing psychopathology in children with chronic illness, results are likely to generalize across medical diagnoses. In contrast, the Problem Scale results revealed a significant difference between the Pulmonary and Cardiac groups. Children with asthma, who constitute the majority in the Pulmonary group, have received a great deal of psychological study because of the association of this disorder with family dysfunction (Creer & Bender, 1995). Our results suggest that, compared to parents of children with cardiac illnesses, the parent of an asthmatic child may have less tolerance for their child's misbehavior. These findings may also reflect the highly complex daily management regimen for children with asthma, in contrast to that for most pediatric cardiac problems.

Because chronically ill children have frequent contact with their physicians, there are many opportunities to monitor the children's behavioral adjustment. One of the difficulties in monitoring during office visits, nonetheless, is the limited time available to conduct behavioral interviews or standardized behavioral observations. The physicians may be left with just a glimpse of the child's behavior despite consistent contact with the family. Well-standardized parent rating scales of child behavior have several advantages in this situation (Schuhmann et al., 1996).. They can be administered and interpreted on-the-spot with families during their appointment, and the parents' ratings on such measures can be compared to age- and gender-based normative data to determine the appropriateness of a child's behavior and the need for consultation or referral.

. For the ECBI, interpreting the Intensity and Problem scale scores together may provide a useful indication of the parent's tolerance of the child's misbehavior. For example, if a parent endorses a relatively high frequency of problem behaviors, but indicates that the child's behavior is not problematic, the parent may be overly lenient with the child and might benefit from discussion of the importance of monitoring and setting limits on the child's behavior. In contrast, if a parent rates the child's behavior problems as occurring infrequently but finds many of the child's behaviors problematic, the parent may be intolerant of misbehavior and might benefit from discussion about developmentally appropriate expectations.

The current study has some limitations that should be addressed in future research. First, additional measures were not used to establish the concurrent validity of the ECBI scales with chronically ill children. It will be important to establish its associations to other behavior rating scales and other methods of behavioral assessment (e.g., interview, observation) with chronically ill children. Second, the clinical utility of the ECBI as an outcome measure in the behavioral management of chronically ill children with significant

psychopathology is not known. Although there is little reason to expect that it would perform differently as a change measure with chronically ill children and families, its treatment sensitivity both in outpatient and inpatient settings should be tested.

Finally, we have used a sample of convenience to establish norms for chronically ill children. A broad national sampling of chronically ill children stratified on important demographic factors including a fuller range of ethnic representation will provide more precise normative information among demographic subgroups. Local norms for patient populations in specific geographic areas will continue to be important as well. Nevertheless, the characteristics of the present sample, including the breadth of medical conditions and demographic diversity, suggest that these results will generalize broadly to other groups of chronically ill children and both complement and extend the norms for general pediatric patients (Colvin et al., 1999).

In summary, the availability of norms for both healthy and chronically ill children across the entire age range of the ECBI, from 2 to 16, makes the ECBI a particularly cost- and time-efficient way to screen behavioral adjustment both in general practice and in medical specialty clinics. The simplicity of interpretation allows for immediate feedback to the family regarding expectations for child behavior, advice on behavior management, and referral, if indicated. The opportunity for early identification allows for mental health interventions to be provided at an earlier stage, which may increase their effectiveness and more quickly ease the parenting stress in families of chronically ill children.

References

:Achenbach, T. M. (1991). Manual *for the Child Behavior Checklist/4-18 and 1991 profile*. Burlington, VT: University of Vermont, Department of Psychiatry.

Bennet, D. (1994). Depression among children with chronic medical problems: A meta-analysis. *Journal of Pediatric Psychology, 19,* 149-169.

Bishop, S. J., Murphy, J. M., Jellinek, M. S., & Dusseault, K. (1991). Psychosocial screening in pediatric practice: A survey of interested physicians. Clinical Pediatrics, 30, 142-147. Physical and psychological functioning. *Pediatric Clinics of North America, 31*, 33-45.

Brestan, E.V., Eyberg, S.M., Algina, J., Johnson, S.B., & Boggs, S.R. (2003). How annoying is it? Defining parental tolerance for child misbehavior. *Child & Family Behavior Therapy, 25, 1-15.*

Cadman, D., Boyle, M., Szatmari, P., & Offord, D. (1987). Chronic illness, disability, and mental and social well-being: Findings of the Ontario Child Health Study. *Pediatrics, 79,* 805-813.

Canning, E. H., & Kelleher, K. (1994). Performance of screening tools for mental health problems in chronically ill children. Archives of Pediatric and Adolescent Medicine, 148, 272-278.

Colvin, A., Eyberg, S. M., & Adams, C. D. (1999). *Restandardization of the Eyberg Child Behavior Inventory*. Retrieve from http://www.pcit.org.

Creer, T. L., & Bender, B. G. (1995). Pediatric asthma. In M. Roberts (Ed.), *Handbook of Pediatric Psychology* (2nd ed., pp. 219-240). New York: Guilford Press.

Creer, T. L., & Bender, B. G. (1995). Pediatric asthma. In M. Roberts (Ed.), Handbook of Pediatric Psychology

(2nd ed., pp. 219-240). New York: Guilford Press.

Eisenstadt, T.H., McElreath, L.S., Eyberg, S.M., & McNeil, C.B. (1994). Interparent agreement on the Eyberg Child Behavior Inventory. *Child & Family Behavior Therapy, 16*, 21-28.

Eyberg, S. M. (1985). Behavioral assessment: Advancing methodology in pediatric psychology. *Journal of Pediatric Psychology, 10,* 123-139.

Eyberg, S. M. (1992). Parent and teacher behavior inventories for the assessment of conduct problem behaviors in children. In L. VanderCreek, S. Knapp, & T. L. Jackson (Eds.). *Innovations in Clinical Practice: A Source Book* (Vol. 12). Sarasota, FL: Professional Resource Press.

Eyberg, S. M. & Pincus, D. (1999). *Eyberg Child Behavior Inventory and Sutter-Eyberg Student Behavior Inventory-Revised: Professional manual*. Odessa, FL: Psychological Assessment Resources.

Eyberg, S. M. & Robinson, E. A. (1983). Conduct problem behavior: Standardization of a behavioral rating scale with adolescents. *Journal of Clinical Child Psychology, 12*, 347-354.

Gortmaker, S.L., & Sappenfield, W. (1984). Chronic childhood disorders: Prevalence and impact. *Pediatric Clinics of North America, 31*, 3-18.

Jellinek, M. S., Murphy, J. M., & Burns, B. J. (1986). Brief psychosocial screening in outpatient pediatric practice. *The Journal of Pediatrics, 109,* 371-378.

Jellinek, M. S., Murphy, J. M., Robinson, J., Feins, A., Lamb, S., & Fenton, T. (1988). Pediatric Symptom Checklist: Screening school-age children for psychosocial dysfunction. *The Journal of Pediatrics, 112*, 201-209.

Johnson, S. B., & Rodrigue, J. R. (1997). Health-related disorders. In E.J. Mash, & L.G. Terdal (Eds.), *Assessment of childhood disorders* (3rd edition) (pp. 481-519). New York: Guilford.

Lavigne, J. V., & Faier-Routman, J. (1992). Psychological adjustment to pediatric physical disorders: A Metal-analytic review. *Journal of Pediatric Psychology, 17,* 133-157.

Lloyd, J., Jellinek, M. S., Little, M., Murphy, J. M., & Pagano, M. (1995). Screening for psychosocial dysfunction in pediatric inpatients. *Clinical Pediatrics, 34,* 18-24.

Murphy, J. M., Arnett, H. L., Bishop, S. J., Jellinek, M. S., & Reede, J. Y. (1992). Screening for psychosocial dysfunction in pediatric practice: A naturalistic study of the Pediatric Symptom Checklist. *Clinical Pediatrics, 31,* 660-667.

Perrin, E. C., Stein, R. E. K., & Drotar, D. (1991). Cautions in using the Child Behavior Checklist: Observations based on research about children with a chronic illness. *Journal of Pediatric Psychology, 16*, 411-421.

Pless, I.B. (1984). Clinical assessment: Physical and psychological functioning. *Pediatric Clinics of North America, 31,* 33-45.

Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child Psychology, 9*, 22-28.

Schuhmann, E. M., Durning, P. E., Eyberg, S. M., & Boggs, S. R. (1996). Screening for conduct problem behavior in pediatric settings using the Eyberg Child Behavior Inventory. *Ambulatory Child Health, 2,* 35-41.

Thompson, R. J., Hodges, K., & Hamlett, K. W. (1990). A matched comparison

of adjustment in children with cystic fibrosis and psychiatrically referred and nonreferred children. *Journal of Pediatric Psychology, 15*, 745-759.

Wallander, J. L., & Thompson, R. J., Jr. (1995). Psychosocial adjustment of children with chronic physical conditions. In M. Roberts (Ed*.), Handbook of Pediatric Psychology* (2nd ed., pp. 124-141). New York: Guildford Press.

Wallander, J. L., Varni, J. W., Babani, L. V., Banis, H. T., & Wilcox, K. T. (1988). Children with chronic physical disorders: Maternal reports of their psychological adjustment. *Journal of Pediatric Psychology, 13,* 197-212.

Table 1

Normative Data For Chronically Ill Children on Individual Items on the Eyberg Child Behavior Inventory

	Item	*Intensity Mean*	*SD*	*% as Problem*
1.	Dawdles in getting dressed	3.2	1.8	18.3
2.	Slow in getting ready for bed	3.7	1.9	21.4
3.	Argues with parents about rules	3.4	1.9	31.0
4.	Cries easily	3.3	1.7	17.1
5.	Steals	1.2	0.7	5.2
6.	Physically fights with friends own age	2.0	1.4	9.9
7.	Is easily distracted		1.8	24.3
8.	Dawdles or lingers at meal time	3.0	1.9	18.6
9.	Refuses to go to bed on time	3.3	1.9	27.0
10.	Gets angry when doesn't get own way	4.0	1.8	33.6
11.	Yells or screams	3.1	1.8	22.9
12.	Lies	2.2	1.5	21.2
13.	Has poor table manners	2.3	1.3	7.0
14.	Does not obey house rules on own	2.9	1.6	23.5
15.	Has temper tantrums	2.7	1.7	20.0
16.	Hits parents	1.5	1.2	7.8
17.	Teases or provokes other children	2.3	1.5	17.4
18.	Physically fights with sisters and brothers	2.5	1.7	21.4
19.	Has short attention span	3.2	1.9	21.4
20.	Has difficulty concentrating on one thing	3.1	1.8	20.9
21.	Refuses to do chores when asked	2.9	1.7	27.5
22.	Acts defiant when told to do something	2.8	1.6	24.6
23.	Whines	3.1	1.7	24.3
24.	Is careless with toys and other objects	2.9	1.7	20.6
25.	Verbally fights with sisters and brother	3.2	1.9	32.2
26.	Interrupts	3.4	1.8	29.0
27.	Has difficulty entertaining self alone	2.3	1.7	9.3
28.	Refuses to eat food presented	2.8	1.7	19.1
29.	Refuses to obey until threatened with punishment	2.9	1.6	26.7
30.	Sasses adults	2.3	1.6	19.7
31.	Destroys toys and other objects	1.8	1.4	12.2
32.	Verbally fights with friends own age	2.4	1.4	9.9
33.	Constantly seeks attention	3.2	1.8	13.9
34.	Fails to finish tasks or projects	3.1	1.6	24.1
35.	Is overactive or restless	3.1	1.8	19.7
36.	Wets the bed	2.1	1.9	12.5

Table 2

Internal Consistency of the Eyberg Child Behavior Inventory in Separate Demographic Groups of Chronically Ill Children

Demographic Group	*n*	Intensity Scale[a]	Problem Scale[b]
Males	194	.93	.93
Females	151	.93	.90
Caucasian	273	.94	.92
African-American	58	.90	.91
Ages 2-6	135	.93	.93
Ages 7-11	108	.94	.90
Ages 12-16	102	.94	.90
Urban	199	.92	.91
Rural	137	.94	.93

[a] Cronbach's alpha used to estimate internal consistency.

[b] Point biserial correlations used to estimate internal consistency.

Table 3
Correlations[a] Between ECBI Scores and Demographic Variables

Demographic Variable	Intensity Scale	Problem Scale
Age	-.09	.08
Gender	-.15**	-.08
Race	-.15**	-.06
SES	-.04	-.01
Rural/Urban	.10	.12*

[a]Correlation coefficient based on n = 331. Only Caucasian and African-American participants were included as sample sizes were much smaller for other ethnic groups. * p < .05; ** p < .01.

Table 4

Mean ECBI Intensity Scale Scores By Age Group and Gender

		Intensity Score	
Group	*n*	Mean	*SD*
All Children	345	100.7	33.0
Ages 2-6	135	104.9	32.1
Ages 7-11	108	103.0	32.6
Ages 12-16	102	93.0	33.4
Males	194	104.7	33.9
Ages 2-6	73	112.8	33.6
Ages 7-11	65	109.7	31.7
Ages 12-16	56	88.5	31.6
Females	151	95.6	31.1
Ages 2-6	62	95.5	27.7
Ages 7-11	43	92.8	31.6
Ages 12-16	46	98.4	35.2

Table 5

Mean ECBI Scores by Illness Category

Illness Category	*n*	*Intensity* *M*	*Intensity* *SD*	*Problem* *M*	*Problem* *SD*
Neurological	63	102.9	33.3	7.7	6.7
Hematological/Neoplastic	50	97.9	33.1	5.9	7.1
Infectious/Immunological	29	104.5	30.1	8.1	7.7
Pulmonary	76	107.4	37.1	8.9	8.3
Cardiac	49	97.1	31.5	4.1	4.4
Gastrointestinal/Hepatic	17	88.5	26.7	7.2	5.3
Renal	54	98.0	31.7	7.7	7.2
Endocrine	7	91.0	18.5	5.0	7.5